REMARKS

The Amendment

Claim 13 has been amended to correct an obvious typographical error. It is clear that the rare earth metal oxide must be cerium *oxide*, not just cerium. Applicant respectfully submits that this amendment adds no new matter to the application and earnestly solicits entry thereof.

Claim 46 has been amended to recite that the claim is directed to a "combustible cigarette *treatment* paper." This amendment is supported throughout the application, including in particular at page 7, lines 17-24. Applicant respectfully submits that this amendment adds no new matter to the application and earnestly solicits entry thereof.

The Invention

The claims are directed to a cigarette having a tobacco rod and a wrapper for the rod, wherein the wrapper comprises porous particulate cerium oxide. Claims also are directed to a cigarette comprising a tobacco rod and a cigarette paper that is combustible, burns, and ashes. The paper comprises a rare earth metal oxide and an essentially non-combustible, finely divided porous particulate adjunct for the rare earth metal oxide. In particular, claims are directed to a cigarette comprising a tobacco rod and a cigarette paper that is combustible, burns, and ashes, and which paper has a sidestream smoke treatment composition comprising, in combination, a rare earth metal oxide and an essentially non-combustible finely divided porous particulate adjunct for the rare earth metal oxide.

Claim 45 is directed to a low sidestream smoke cigarette comprising a tobacco rod and a treatment paper that is combustible, burns and ashes. The treatment paper has a sidestream smoke treatment comprising an oxygen storage and donor metal oxide oxidation catalyst precursor and an essentially non-combustible finely divided porous particulate adjunct for the

catalyst. The oxygen storage and donor metal oxide oxidation catalyst release oxygen at free burn temperatures for the cigarette.

Claim 46 is directed to a combustible cigarette paper for use on a smokable tobacco rod of a cigarette. The combustible cigarette paper is for reducing the sidestream smoke emitted from a burning cigarette. The paper is combustible, burns, and ashes, and has a sidestream smoke treatment comprising an oxygen storage and donor metal oxide oxidation catalyst precursor and an essentially non-combustible finely divided porous particulate adjunct. The oxygen storage and donor metal oxide oxidation catalyst release oxygen at free burn temperatures of a cigarette made from the paper.

The Office Action

Claims 45 and 46 were denied benefit of prior-filed application serial number 09/954,432, because this application allegedly does not mention burn rate temperature that would provide for the release of oxygen from the oxygen storage and donor catalyst.

Claims 20-23 and 45-46 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter Applicant regards as the invention. The claimed tobacco rod and treatment paper are said to have no nexus.

Claims 1, 12, and 20 stand rejected under 35 U.S.C. § 102(b) as anticipated by Snaidr, WO 98/16125, particularly over claim 29 thereof.

Claims 1, 4-7, 12-14, 17-18, 20-21, and 45-46 stand rejected under 35 U.S.C. § 102(e) as anticipated by Bowen, US 6,286,516, or under 35 U.S.C. § 102(a) as anticipated by Bowen, WO 99/53778. Cerium oxide is said to be applied to zeolite substrate. In particular, the oxygen storage component of Bowen releases oxygen at 300°C, whereas the free burn temperature of those cigarettes is between about 400 and 900°C.

Claims 8 and 19 stand rejected under 35 U.S.C. § 103(a) as obvious over Bowen WO '778 in view of Schlatter, US 5,040,551. According to the Office Action, these documents indicate that, at the time the invention was made, it would have been obvious to have used iron oxide as catalyst.

Claim 9 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Bowen '778. The Office Action admits that the loading rate of cerium oxide is not disclosed, but the amount, and optimization of the amount, would have been obvious to preclude depletion of the number of puffs in the cigarette by controlling the amount of oxygen release.

Claims 10-11, 15-16, and 22-23 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Bowen '778 in view of Grodek, US 5,004,711. Bowen is said to teach sorbatives, such as a zeolite, and teaches that zirconium oxide is a sorbative. The Office Action asserts that, at the time the invention was made, it would have been obvious to substitute known sorbents.

Claims 1 and 45-46 stand rejected on the ground of non-statutory obviousness-type double patenting over claim 19 of United States Patent Number 6,904,918. Although the claims are not identical, the Office Action asserts that it would have been obvious to put cerium oxide on the porous adjunct to yield a porous cerium oxide, and to do so in an appropriate quantity.

Claims 1, 4-18, 12-14, 20-21, and 45-46 stand rejected on the ground of non-statutory obviousness-type double patenting over claims 22-24 and 26 of United States Patent Number 6,810,884. Although the claims are admittedly not identical, they are said not to be patentably distinct. The '884 patent discloses treatment material having properties including a porosity of less than about 200 Corestas, cerium oxide, and zeolite as the adjunct. Other features are ascribed to make other pending claims unpatentable.

Claims 1-2, 4-8, 12-14, 20-21, and 45-46 stand rejected on the ground of non-statutory obviousness-type double patenting over claims 18-20, 23, and 50 of United States Patent

Number 6,799,578. The claims are said not to be patentably distinct, although they are not identical.

Claims 1, 12, 20, 45, and 46 stand rejected on the ground of non-statutory obviousness-type double patenting over claim 29 of United States Patent Number 6,371,127. It is said to have been obvious to provide cerium oxide on a porous element, and to have expected the catalyst to release oxygen at the free burn rate temperature of the cigarette.

These same claims also stand rejected on the ground of obviousness-type double patenting over claims 5 and 13 of United States Patent Number 6,286,516.

The Cited Documents

WO 98/16125 is directed to an apparatus used in combination with a tobacco product to control sidestream smoke and to increase the number of puffs available to the smoker from a given amount of tobacco. The apparatus comprises a tube having a predetermined porosity into which tobacco product is placed. The porosity of the tube is selected to provide sidestream smoke reduction and to reduce the free-burn rate between puffs. Claim 29 is directed to this apparatus having a ceramic oxide comprising cerium oxide.

Bowen, United States Patent Number 6,286,516, is directed to a porous, non-combustible material for treating sidestream smoke. This material is used to surround a conventional cigarette. In particular, Bowen is directed to a cigarette that has a non-combustible wrapper that surrounds and is in substantial contact with conventional cigarette paper portion of a cigarette.

The material has a high porosity which encourages conventional free-burn rate for a cigarette. The oxygen storage component releases oxygen at free-burn rate temperatures adjacent a burning coal to both:

a) compensate for the material reducing rate of oxygen diffusion to a burning coal to ensure conventional free-burn rate; and

b) contribute to the oxidation treatment of components of sidestream smoke.

The cigarette is designed to have a sufficiently high porosity, usually in excess of 200 Coresta units, which encourages a conventional free-burn rate of the conventional cigarette. In other words, the wrapper is transparent to the cigarette so the cigarette burns at its normal rate to give the usual flavor and taste of a conventional cigarette. The presence of the oxygen donor material is to release sufficient oxygen to compensate for any reduction in oxygen diffusion to the burning coal caused by the non-combustible material. Thus, the material ensures the conventional free-burn rate and contributes to the oxidation treatment of components of sidestream smoke.

Schlatter, United States Patent Number 5,040,551, discloses a method for reducing the amount of carbon monoxide produced in combustion of carbonaceous materials. The materials are coated with a non-combustible particulate matter. The particulate matter is microporous and is a high-melting oxide. The thickness of the coating is closely controlled to ensure proper carbon monoxide reduction. Catalysts also can be added. Tobacco may surround the carbonaceous materials.

Grodek, United States Patent Number 5,004,711 is direction to preparation of colloidal zirconium oxide sols. Ceria, calcia, magnesia, and other oxides can be used as stabilizer for zirconia powders obtained.

The Invention in view of the Cited Documents

Priority

Claims 45 and 46 were denied benefit of priority application United States Application Serial Number 09/954,432, which issued as United States Patent Number 6,799,578. The Office Action asserts that the pending application adds and claims additional disclosure not presented in

the priority application. The added disclosure is said to be directed to the release of oxygen from the oxygen storage and donor catalyst at the burn temperature of the cigarette.

Applicant respectfully traverses this denial of benefit. The present application was amended to include such language in the specification in the Preliminary Amendment dated March 12, 2004. Importantly, these amendments also were presented during the prosecution of U.S. Patent Application No. 09/954,432 in an amendment filed July 28, 2003. A copy of this amendment is enclosed for the Examiner's convenience. As can be seen in the supporting declaration of Brian Hanlon submitted December 4, 2003, in the '432 application, the text in question relating to the burn rate temperature that would provide for release of oxygen from the oxygen storage and donor catalyst was specifically incorporated by reference from a related international application. This text was merely incorporated by reference as of right. The Examiner of the '432 application accepted these specific recitations of text that was present by reference, and was merely incorporated explicitly from the related application.

Thus, Applicant respectfully submits that this text is not objectionable new matter in this application, as it appeared by right in the priority application. Applicant respectfully submits that priority is rightfully claimed for claims 45 and 46, and requests that priority for these claims be recognized.

Rejections under 35 U.S.C. § 112

Claims 20-23 and 45-46 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter applicant regards as the invention. The Office Action asserts that the claimed tobacco rod and treatment paper have no nexus, and that the term "said treatment paper" in claim 46 lacks antecedent basis.

Applicant respectfully traverses these rejections. First, the treatment paper is defined and described at the paragraph bridging pages 8 and 9. Applicant respectfully submits that one skilled in the art would understand the nexus between the treatment paper and the tobacco rod without any further clarification. Further, claim 46 has been amended to recite "A combustible cigarette *treatment* paper" to provide a proper antecedent basis for the phrase in question.

Rejections under 35 U.S.C. § 102

Claims 1, 12 and 20 stand rejected under 35 U.S.C. § 102(b) as anticipated by International Patent Application No. WO 98/16125 to Snaidr *et al.* (equivalent to U.S. Patent No. 6,371,127). In particular, the Office Action asserts that Claim 29 discloses a porous tubular element comprising cerium oxide and encasing a tobacco charge, which is deemed to be a tobacco rod and to disclose the claimed invention.

Applicant respectfully traverses this rejection. The cited document is directed to a porous apparatus in the form of a tubular element, and neither suggests nor discloses a wrapper comprising *porous particulate* cerium oxide as is required by the claims. The cited document teaches only that the tubular element *itself* is porous, and does not disclose or suggest that the cerium oxide itself is porous, as required in claim 1.

With respect to Claims 12 and 20, the cited references does not teach or suggest a cigarette paper (Claim 12) or a treatment paper (Claim 20) comprising, in combination, a rare earth metal oxide and an essentially non-combustible finely divided porous particulate adjunct for said rare earth metal oxide.

The exterior tubular element (12) of the device of International Patent Application No. WO 98/16125 contains a cigarette or tobacco charge within its interior and is not consumed when the cigarette is smoked. As described at page 11, lines 11 to 24, the tubular element is reusable. The specification at page 15, lines 15 to 18, teaches that the tubular element is made

from non-combustible materials such as ceramics, plastics, treated papers and wood-derived materials.

A catalyst may be incorporated within the material used to form the tubular element (12), on the inner or outer surfaces of the tubular element or in the material used to form the porous elements (18). See at least page 1, lines 23 to 24; page 6, lines 7 to 13; page 7, line 33 to page 8, line 3; which describe the tubular element (12) and inclusion of a catalyst and at least page 12, lines 15 to 17, which describes the presence of the catalyst in the porous elements (18).

At page 15, line 18, the cited document reiterates that the interior of the tube may be coated with catalytic particles to catalyse oxidation of combustion products. Suitable catalysts are described in detail from page 27, line 29 through to page 33, line 7.

Thus, Applicant respectfully submits that International Patent Application No. WO 98/16125 discloses a *physical* means of controlling sidestream smoke through use of a device that retards airflow (thus controlling free-burn rate) and which optionally has the ability to absorb combustion products and so may be coated with a catalyst to aid oxidation of combustion products. The inclusion of a catalyst is not essential for the device of International Patent Application No. WO 98/16125 to achieve effective sidestream smoke control – note that the presence of a catalyst in the cited document is described as an optional feature in the specification.

In contradistinction, claims 12 and 20 are directed to a cigarette paper or treatment paper, respectively, comprising, in combination, a rare earth metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for said catalyst. Unlike the tubular element (12) of International Patent Application No. WO 98/16125, the paper of Claims 12 and 20 is combustible, burns and ashes, as recited in the pending claims. The tubular element (12) of International Patent Application No. WO 98/16125 is an apparatus, not a

treatment material or cigarette paper of the claimed invention. Rather than physically retarding airflow to reduce sidestream smoke, the present invention achieves sidestream smoke control through the porous and catalytic nature of the *components* of the cigarette or cigarette paper itself, not through physical means as in the cited document.

Therefore, Applicant respectfully traverses this rejection and earnestly solicits allowance of the pending claims.

Claims 1, 4-7, 12-14, 17-18, 20-21 and 45-46 stand rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,286,516 to Bowen *et al.* (equivalent to International Patent Application No. WO 99/53778).

Applicant respectfully submits that the cited reference does not disclose or suggest a wrapper comprising *porous particulate* cerium oxide of Claim 1.

With respect to pending independent Claims 12, 20, 45 and 46, the use of the cigarette paper or treatment paper of the claimed invention produces a cigarette paper with very little sidestream smoke on burning because of the novel combination of an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for the catalyst or, more specifically claimed in Claims 12 and 20, a rare earth metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for the catalyst. The oxygen storage and donor metal oxide oxidation catalyst and the non-combustible finely divided porous particulate adjunct are used in combination to achieve sidestream smoke reduction. As taught at pages 17 and 18 of the specification, 'in combination' means that the materials are used together, for example, either by co-mingling, coating the catalyst on the adjunct, impregnating the catalyst within or on the porous surface adjunct or in layers. Quite surprisingly, this combined use of the metal oxide with the adjunct provides sidestream smoke control. It was quite unexpected that these two constituents used

together in combination provide sidestream smoke control by simply being part of a cigarette paper. Other than constituents used to provide this combination in sheet form, there is no other requirement for other components to control sidestream smoke.

The cigarette of the cited document is designed to burn at conventional free-burn rates and to rely on the oxygen storage component to release oxygen to support that free-burn rate. This document does not contemplate that sidestream smoke control can be realized by combined use of an oxygen storage and donor metal oxide (e.g. rare earth metal oxide) in combination with porous adjunct to reduce sidestream smoke, as set forth in the pending claims. This use in combination is not realized in the cited document.

For at least these reasons, Applicant respectfully submits that the cited document does not teach or suggest the claimed invention.

Rejections under 35 U.S.C. § 103

Claims 8 and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bowen in view of U.S. Patent No. 5,040,551 to Schlatter. Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bowen.

Applicant respectfully traverses these rejections. Schlatter adds nothing relevant to the disclosure of Bowen. Schlatter discloses that carbon monoxide levels of coated carbonaceous materials can be reduced by adding metals or their oxides to the coating of the fuel material. This discloses nothing relevant to the rejected claims, and Applicant respectfully traverses this rejection of claims 8 and 19.

Applicant respectfully submits that Bowen does not render claim 9 obvious. As the Office Action admits, Bowen does not suggest or disclose a loading rate. Thus, it is only with the information provided in the pending application that one can suggest a loading rate. This is true because the skilled practitioner can calculate a loading based only on the use disclosed in the

pending application. Thus, Applicant respectfully submits that it is only by impermissible hindsight reconstruction that the skilled practitioner can make this calculation. Applicant respectfully traverses this rejection.

The Examiner has also rejected Claims 10-11, 15-16 and 22-23 under 35 U.S.C. § 103(a) as being unpatentable over Bowen in view of U.S. Patent No. 5,004,711 to Grodek. Applicant respectfully traverses this rejection. Grodek is directed to stabilization of zirconia powders made from zirconia sols. Ceria, magnesia, and other oxides can serve as stabilizer. Applicant respectfully submits that this disclosure adds nothing relevant to the disclosure of Bowen, and Applicant respectfully traverses this rejection.

Rejections based on Obviousness-type Double Patenting

Applicant submits herewith a terminal disclaimer with respect to U.S. Patents Nos. 6,904,918; 6,810,884; and 6,799,578. Thus, Applicant respectfully traverses these rejections.

Claims 1, 12, 20, 45, and 46 stand rejected on the ground of obviousness-type double patenting over claim 29 of U.S. Patent No. 6,371,127 and claims 5 and 13 of Bowen, U.S. Patent No. 6,286,516. Applicant respectfully traverses these rejections.

The '127 patent discloses a significantly different invention than is set forth in the pending claims. As set forth above, the '127 patent discloses a tubular apparatus that is added to a cigarette or other tobacco mass. The *apparatus* is porous, and the material is non-combustible. This is in direct contradistinction with the pending claims, where the ceria is porous, or the cigarette paper or treatment paper is combustible, burns, and ashes. Applicant respectfully submits that these claims are not obvious in view of the disclosure of the cited document, and Applicant respectfully traverses the rejection.

Similarly, Bowen discloses a different invention. Again, the apparatus is non-combustible. As set forth above, there are significant differences between what Bowen discloses or fairly suggests and the pending claims. Applicant respectfully traverses this rejection.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance. All ambiguities have been removed from the claims. A terminal disclaimer has been filed over three patents, and explanations regarding patentability of the pending claims in view of the cited documents have been set forth for the Examiner's consideration.

Applicant respectfully traverses the pending rejections and earnestly solicits favorable action thereon.

Respectfully submitted,

Date: July 6, 2007

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE THE APPLICATION OF	)
	) Atty Dkt No.: 000417.0002
Stanislav M. SNAIDR et al.	)
	)
SERIAL NO.: 09/954,432	) GROUP ART UNIT: 1731
	)
FILED: September 18, 2001	)
	) Examiner: WALLS, Dionne A.
FOR: Low Sidestream Smoke Cigarette With Combustible Paper	)

AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1350

Dear Sir:

This is responsive to the Office Action dated January 28, 2003. Kindly amend this application as follows:

IN THE SPECIFCATION

Please amend the specification as set forth below:

Please replace the Paragraph on page 5, lines 22-29 with the following:

The invention provides for a significant reduction in sidestream smoke in its various applications. It has been found that such reduction in sidestream smoke can surprisingly be achieved by the combined use in a sidestream smoke treatment composition, of an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for the catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette. This composition may be used with normal combustible cigarette

paper to provide acceptable free-burn rates while minimizing or virtually eliminating visible sidestream smoke.

Please replace the Paragraph on page 7, lines 17-22, with the following:

According to other aspects of the invention, a low sidestream smoke cigarette comprises a conventional tobacco rod and a combustible treatment paper having a sidestream smoke treatment composition for said rod, said treatment composition comprises in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for said catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette.

Please replace the Paragraph beginning on page 7, lines 23-30 and continuing onto page 8, lines 1-2 with the following:

According to an aspect of the invention, a low sidestream smoke cigarette comprising a conventional tobacco rod, and a combustible treatment paper having a sidestream smoke treatment composition comprising cerium oxide which functions both as an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for the catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette. According to another aspect of the invention, a furnish composition for use in making a cigarette treatment paper for reducing sidestream smoke emitted from a burning cigarette comprises in combination an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette.

Please replace the paragraph on page 8, lines 3-8, with the following:

According to a further aspect of the invention, a low sidestream smoke cigarette comprising a conventional tobacco rod, and a combustible treatment paper having a sidestream smoke treatment composition, said treatment composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible zeolite adjunct for said catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette.

Please replace the paragraph on page 8, lines 9-13, with the following:

According to a further aspect of the invention, a slurry composition for application to cigarette paper for reducing sidestream smoke emitted from a burning cigarette comprises in combination with an oxygen storage and donor metal oxide oxidation catalyst, an essentially non-combustible finely divided porous particulate adjunct for said catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette.

Please replace the paragraph on page 8, lines 14-19, with the following:

According to another aspect of the invention, a combustible cigarette paper for use on a smokable tobacco rod of a cigarette for reducing sidestream smoke emitted from a burning cigarette, the cigarette treatment paper including a sidestream smoke treatment composition comprising in combination an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette.

Please replace the paragraph on page 8, lines 20-25, with the following:

According to another aspect of the invention, a method for reducing sidestream smoke emitted from a burning cigarette, comprises treating sidestream smoke with a treatment composition carried by a combustible cigarette paper, said treatment composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for said catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette.

Please replace the Paragraph beginning on page 13, lines 23-31 and continuing onto page 14, lines 1-8, with the following:

The oxygen donor and oxygen storage metal oxide oxidation catalyst is most preferably selected from the transition metal oxides, rare earth metal oxides, (such as scandium, yttrium, and lanthanide metal series, i.e. lanthanum) and mixtures thereof. It is appreciated that the catalyst may be in its metal oxide form or a precursor of the metal oxide which, at the temperature of the burning cigarette, is converted to a metal oxide to perform its catalytic activities. The selected oxygen donor and oxygen storage metal oxide oxidation catalyst in its catalytic form releases oxygen at free burn rate temperatures of the burning cigarette. The transition metal oxides may be selected from oxides of the group of metals from the Periodic Table consisting of groups IVB, VB, VIB, VIIB, VIII and IB metals and mixtures thereof. Preferred metals from the transition metal group are oxides of iron, copper, silver, manganese, titanium, zirconium, vanadium and tungsten and from the rare earth group are oxides of lanthanide metals such as oxides of cerium. For example, cerium may be used in admixture with any one of the transition metals. It is appreciated that other metal oxide oxidation catalysts may be used with the oxygen storage and oxygen donor type of catalyst. Such other metal catalysts include precious metals and metals from groups IIA, IVA and mixtures thereof. Examples include tin, platinum, palladium and mixtures thereof.

Please replace the Paragraph on page 24, lines 7-24, with the following:

The treatment paper is combustible, burns in a conventional manner, and ashes. The burning characteristics were measured quantitatively following the ISO Procedure, ISO 4387, see Second Ed., October 15, 1991 (for determination of total and nicotine-free dry particulate matter using a routine analytical smoking machine). Prototype 359-3, as shown in Table 3A, has an average puff count of 8.7 puffs per prototype compared to an average 9.5 puffs per conventional cigarette. The calculated burn rates show in Table 3A that Prototype 359-3 has substantially the same burn rate of 0.09 mm/sec as the conventional cigarette. Burn temperature profile measurements were taken in accordance with a technique described in published PCT application WO 99/53778, the subject matter of which is hereby incorporated by reference. The oxygen storage and donor metal oxide oxidation catalyst described in this published PCT application is typical of the oxygen storage and donor metal oxide oxidation catalyst described in this application. As taught in this published PCT application, the selected oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of a burning cigarette. Preferred oxygen storage and donor metal oxide oxidation catalyst are capable of releasing oxygen at elevated temperatures normally in the range of 400° C to 550° C. The results of Table 3A are consistent with the above measurements, showing the Prototype burn characteristics both during the puff and the burn are substantially the same as the conventional cigarette. During puff, the control had a slightly lower temperature as measured at the paper surface, at the centreline of the cigarette and at a position ½ way along the radius of the cigarette. During burning, the paper temperature of the control and the Prototype 359-3 had essentially the same temperature.

IN THE CLAIMS:

Amend claim 1 follows:

1. (Amended). A low sidestream smoke cigarette comprising a conventional tobacco rod, and a combustible treatment paper having a sidestream smoke treatment composition, said treatment composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for said catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures for said cigarette.

Amend claim 9 as follows:

9. (Amended). A cigarette of claim 1, wherein said catalyst is selected from the group consisting of a transition metal oxide selected from the group consisting of group VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof; a rare earth metal oxide and mixtures thereof; and a mixture of said transition metal oxide and said rare earth metal oxide.

Amend claim 10 as follows:

10. (Amended). A cigarette of claim 1, wherein said catalyst is a mixture of a rare earth metal oxide and a transition metal oxide, said transition metal oxide being selected from the group consisting of group IVB, VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof.

Amend claim 17 as follows:

17. (Amended). A cigarette of claim 16 wherein said selected metal or metal oxide oxidation catalyst is selected from the group consisting of platinum, palladium, copper oxide, iron oxide, magnesium oxide, silver oxide, titanium oxide, zirconium oxide and mixtures thereof.

Amend claim 26 as follows:

26. (Amended). A low sidestream smoke cigarette comprising a conventional tobacco rod, and a combustible treatment paper having a sidestream smoke treatment composition, said treatment composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for said catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures for said cigarette and wherein a first amount of cerium oxide in said treatment composition is said particulate adjunct and a second amount of said cerium oxide in said treatment composition is said oxygen donor catalyst.

Amend claim 42 as follows:

42. (Amended). A low sidestream smoke cigarette comprising a conventional tobacco rod, and a combustible treatment paper having a sidestream smoke treatment composition comprising cerium oxide which functions both as an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for said catalyst, where said cerium oxide releases oxygen at free burn rate temperatures of said cigarette.

Amend claim 43 as follows:

43. (Amended). A furnish composition for use in making a cigarette treatment paper for reducing sidestream smoke emitted from a burning cigarette, said furnish composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct where said oxygen storage and donor metal oxide oxidation catalysts releases oxygen at free burn rate temperatures of a cigarette made from paper derived from said furnish composition.

Amend claim 45 as follows:

45. (Amended). A furnish composition of claim 44, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is selected from the group consisting of a transition metal oxide, selected from the group consisting of group VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof; a rare earth metal oxide and mixtures thereof; and a mixture of said transition metal oxide and said rare earth metal oxide.

Amend claim 46 as follows:

46. (Amended). A furnish composition of claim 44, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is a mixture of a rare earth metal oxide and a transition metal oxide said transition metal oxide being selected from the group consisting of group IVB, VB, VIB,VIIB, VIII, IB metal oxides and mixtures thereof, and said rare earth metal oxides being selected from the group consisting of scandium, yttrium, lanthanum, and lanthanide metal oxides and mixtures thereof.

Amend claim 48 as follows:

48. (Amended). A slurry composition for application to cigarette paper for reducing sidestream smoke emitted from a burning cigarette, said slurry composition comprising in combination an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of a cigarette made from paper derived from said slurry composition.

Amend claim 50 as follows:

50. (Amended). A slurry composition of claim 49, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is selected from the group consisting of a transition metal oxide, selected from the group consisting of group VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof; and a rare earth metal oxide and mixtures thereof and a mixture of said transition metal oxide and said rare earth metal oxide.

Amend claim 51 as follows:

51. (Amended). A slurry composition of claim 49, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is a mixture of a rare earth metal oxide and a transition metal oxide, said transition metal oxide being selected from the group consisting of group IVB, VB, VIB,VIIB, VIII, IB metal oxides and mixtures thereof, and said rare earth metal oxide being selected from the group consisting of scandium, yttrium, lanthanum, and lanthanide metal oxides and mixtures thereof.

Amend claim 54 as follows:

54. (Amended). A combustible cigarette paper for use on a smokable tobacco rod of a cigarette for reducing sidestream smoke emitted from a burning cigarette, said cigarette treatment paper including a sidestream smoke treatment composition comprising in combination an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct where said oxygen storage and donor metal

oxide oxidation catalyst releases oxygen at free burn rate temperatures of a cigarette made from said cigarette paper.

Amend claim 56 as follows:

56. (Amended). A cigarette paper of claim 55, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is selected from the group consisting of a transition metal oxide selected from the group consisting of group VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof; a rare earth metal oxide and mixtures thereof; and a mixture of said transition metal oxide and said rare earth metal oxide.

Amend claim 57 as follows:

57. (Amended). A cigarette paper of claim 55, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is a mixture of a rare earth metal oxide and a transition metal oxide, said transition metal oxide being selected from the group consisting of group IVB, VB, VIB,VIIB, VIII, IB metal oxides and mixtures thereof, and said rare earth metal oxide being selected from the group consisting of oxides of scandium, yttrium, lanthanum, and lanthanide metal oxides and mixtures thereof.

Amend claim 60 as follows:

60. (Amended). A method for reducing sidestream smoke emitted from a burning cigarette, comprising treating sidestream smoke with a treatment composition carried by a combustible cigarette paper, said treatment composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided

porous particulate adjunct for said catalyst, said oxygen storage and donor metal oxide oxidation catalyst releasing oxygen at free burn rate temperatures of said burning cigarette.

Amend claim 62 as follows:

62. (Amended). A method of claim 61, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled carbon or ceramic fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is selected from the group consisting of a transition metal oxide selected from the group consisting of group VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof; a rare earth metal oxide and mixtures thereof; and a mixture of said transition metal oxide and said rare earth metal oxide.

Amend claim 63 as follows:

63. (Amended). A method of claim 62, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled carbon or ceramic fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is a mixture of a rare earth metal oxide and a transition metal oxide, said transition metal oxide being selected from the group consisting of group IVB, VB, VIB,VIIB, VIII, IB metal oxides and mixtures thereof, and said rare earth metal oxide being selected from the group consisting of scandium, yttrium, lanthanum, and lanthanide metal oxides and mixtures thereof.

Amend claim 65 as follows:

65. (Amended). A method of claim 62, wherein said adjunct has a surface area greater than about 20 m^2/g, said sidestream smoke being selectively adsorbed by said adjunct and oxidized by said catalyst to produce non-visible sidestream smoke emanating from said burning cigarette, said catalyst donating

oxygen to assist in maintaining conventional free-burn rates and burn temperature.

Amend claim 71 as follows:

71. (Amended). A cigarette of claim 70, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled carbon or ceramic fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is selected from the group consisting of a transition metal oxide, selected from the group consisting of group VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof; a rare earth metal oxide and mixtures thereof; and a mixture of said transition metal oxide and said rare earth metal oxide.

Amend claim 72 as follows:

72. (Amended). A cigarette of claim 70, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled carbon or ceramic fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is a mixture of a rare earth metal oxide and a transition metal oxide, said transition metal oxide being selected from the group consisting of group IVB, VB, VIB,VIIB, VIII, IB metal oxides and mixtures thereof, and said rare earth metal oxide being selected from the group consisting of oxides of scandium, yttrium, lanthanum, and lanthanide metal oxides and mixtures thereof.

Amend claim 74 as follows:

74. (Amended). A low sidestream smoke cigarette comprising a conventional tobacco rod, and a combustible treatment paper having a sidestream smoke treatment composition, said treatment composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible zeolite adjunct for said catalyst,

said oxygen storage and donor metal oxide oxidation catalyst releasing oxygen at free burn rate temperatures of said cigarette.

Amend claim 75 as follows:

75. (Amended). A cigarette of claim 74, wherein said catalyst is selected from the group consisting of a transition metal oxide, selected from the group consisting of group VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof; a rare earth metal oxide and mixtures thereof; and a mixture of said transition metal oxide and said rare earth metal oxide.

Amend claim 76 as follows:

76 (Amended). A cigarette of claim 75, wherein said catalyst is a mixture of a rare earth metal oxide and a transition metal oxide, said transition metal oxide being selected from the group consisting of group IVB, VB, VIB,VIIB, VIII, IB metal oxides and mixtures thereof.

REMARKS

Claims 1 through 92 are pending in this application.

Examiner Walls is kindly thanked for the Examiner Interview opportunity on June 12. As we discussed, applicant's cigarette, according to the claims of this patent application, constitute a significant advance over the prior art including the Frankenburg patent. Amendments have been made to the claims to clearly distinguish the claimed invention from the Frankenburg reference, as well as a combination of Frankenburg with the other secondary references.

In the Office Action, claims 1-25 and 27-92 were rejected under either 35 U.S.C. §102 or 35 U.S.C. §103. Claim 26 was indicated to be allowable if rewritten in independent form.

Claim 26 has been rewritten in independent form. Claims 1, 9, 10, 17, 26, 42, 43, 45, 46, 48, 50, 51, 54, 56, 57, 60, 62, 63, 65, 71, 72 and 74-76 have also been amended. The specification has been amended as discussed during the interview. Reconsideration of the application is requested.

The principal reference applied in rejecting all of claims 1 through 92, except claim 26, is Frankenburg, U.S. Patent 2,755,207. Frankenburg has been relied on as anticipating claims 43, 48, 54 and 60 and also relied on as rendering obvious claims 1 through 17, 19 to 25, 27 to 41, 43 to 46, 48 to 51, 53 to 57, 59, 60 to 65, 67 to 72. The balance of the claims, except claim 26, have been rejected based on Frankenburg in view of one or more of the remaining cited secondary references of Schlatter et al., Kay et al., Wendelbo and Tatsushima et al.

The secondary references have been relied on to introduce secondary features. Schlatter et al. is relied on as disclosing iron oxide for promoting oxidation. Kay et al. is relied on as disclosing cerium oxide as allegedly a cracking catalyst. Wendelbo is relied on as disclosing a form of zeolite having high acidic properties. Tatsushima et al. is relied on as disclosing a fiber-based catalyst. All of the secondary references, except for Schlatter, relate to subject matter distinct from the tobacco industry and in particular, tobacco products such as cigarettes.

Frankenburg is not directed to a low sidestream smoke cigarette. Instead, Frankenburg describes the use of a siliceous catalyst to treat smoke from a burning cigarette to yield a mainstream smoke substantially free of noxious components and eliminating the generation of disagreeable gases in the sidestream smoke. Frankenburg accomplishes these features by incorporating in fibrous cellulosic materials of the cigarette paper, a finely divided mineral type siliceous catalyst which is incombustible and refractory so as to remain substantially unchanged during combustion of the cigarette paper. The siliceous catalyst may be acid-treated clays, heat-treated montmorillonite and natural and synthetic silicates containing some hydrogen atoms which are

relatively mobile. The catalysts are believed to promote the oxidation of the "usual aldehydic or acidic or hydrocarbon-type products" into harmless forms of carbon dioxide and water vapor. Frankenburg suggests at column 2, line 5, that the tests of various siliceous catalysts have

> "...revealed a striking parallelism between their effectiveness for the purpose of this invention and their effectiveness as a petroleum cracking catalyst."

Frankenburg even suggests that at column 2, line 8

> "In short, there is a well defined trend indicating that a siliceous catalyst which is good for cracking hydrocarbons is good for avoiding the development of objectionable smoke components in a cigarette paper."

Frankenburg further suggests at column 2, line 17

> "This surprising discovery may indicate that the pyrogenic decomposition products of the cellulosic material in cigarette paper are similar, or identical with, hydrocarbons and that the function of the siliceous catalyst consists in cracking these hydrocarbons into smaller molecular units which are then readily and completely oxidized to carbon dioxide and water vapor."

Frankenburg realizes that for the catalyst to be effective in this proposed environment that the siliceous catalyst needs to have a proper "acidic nature" for effectiveness of the catalyst for cracking of high molecular hydrocarbons to lower molecular fragments. He further teaches at column 2, line 31 that

"A class of catalysts with the proper acidic nature which can be used is that of solid particles containing silica and such amounts of difficulty reducible metal oxides that the molecular ratio of silica to the other oxides exceeds appreciably the value of 1. As all these combinations of silica with other oxides such as for instance alumina, zirconia, titania, chromium oxide, magnesium oxide and others..."

Cracking catalysts, which may resemble zeolites, are also described by Frankenburg, such as in column 2, line 52 involving silica gels which have been impregnated with as little as 1% alumina. Dry component cracking catalysts are also described at line 61 of column 2 consisting of silica, alumina and zirconia. Frankenburg suggests approximately 20 to 60% of the siliceous catalysts in the cigarette paper and most preferably, about 45% to 55% based on the weight of the cellulosic material in the paper.

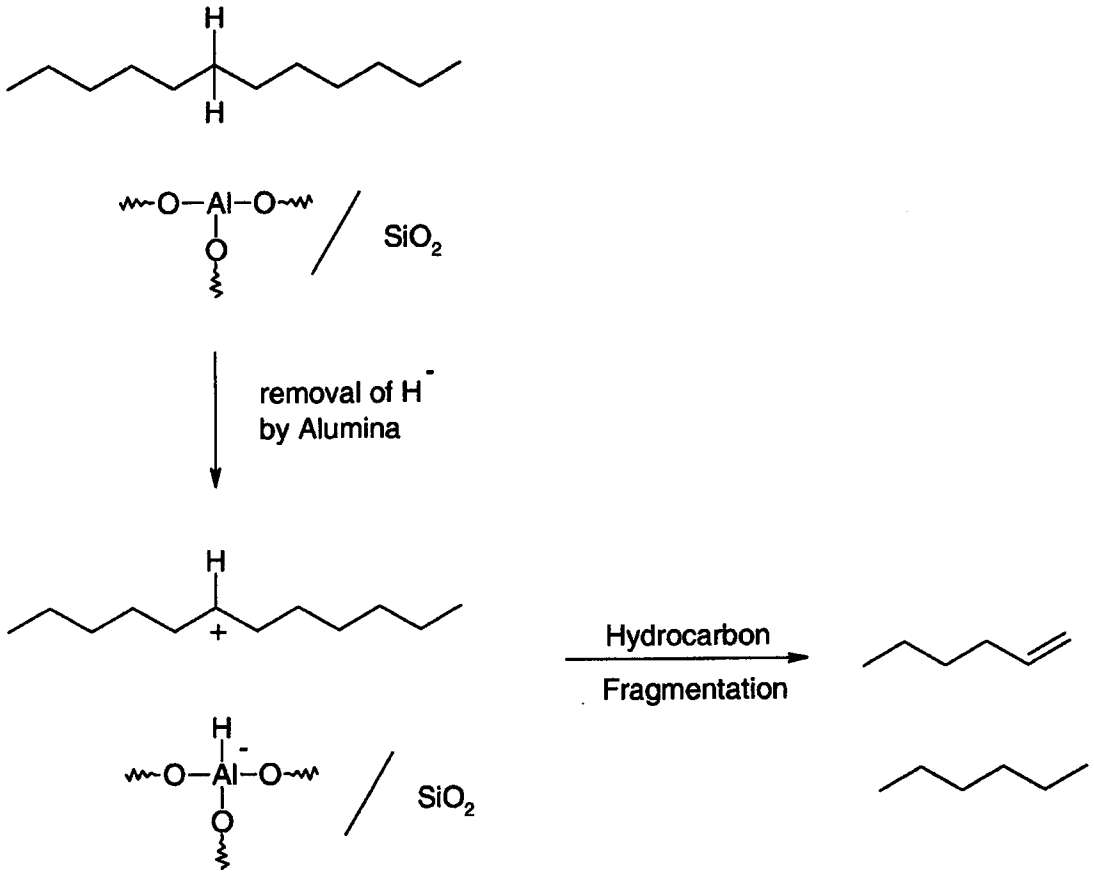
Frankenburg also teaches at column 3, line 9

"To recapitulate, my siliceous catalyst is a combination of major weight proportion of silica and minor weight proportion of one or more difficulty reducible metal oxides..."

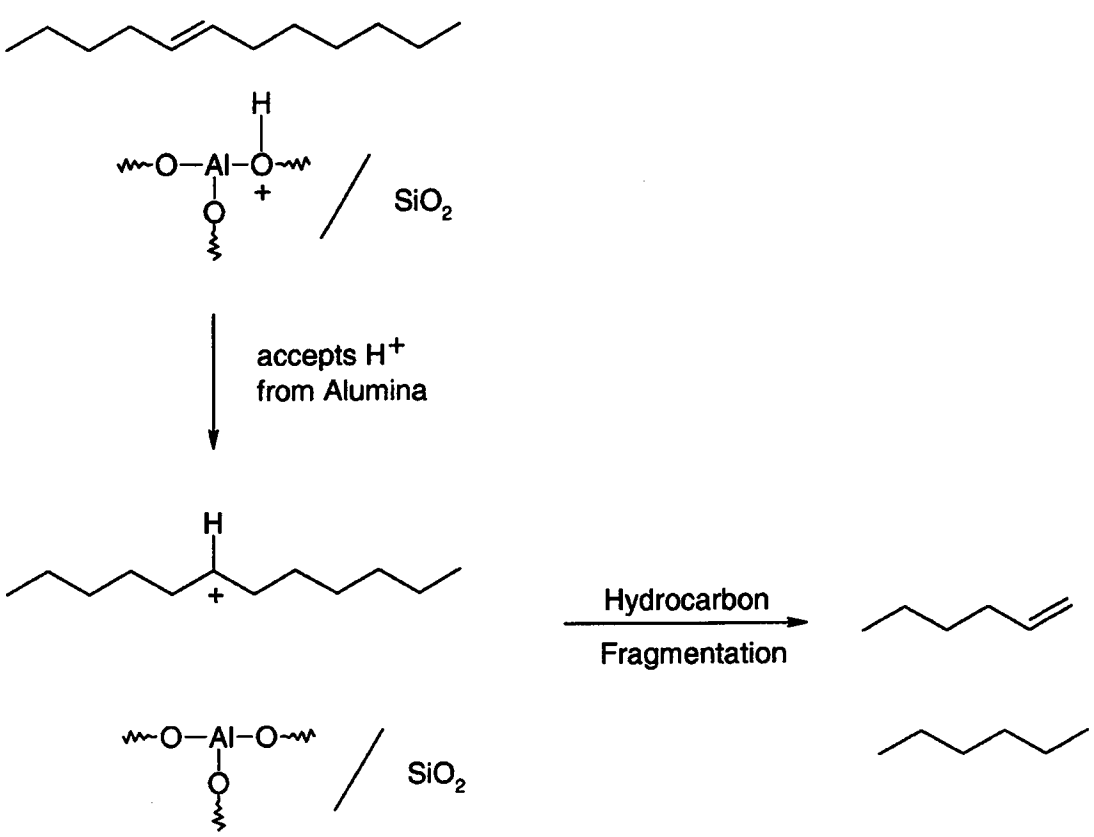
CRACKING CATALYST

To better understand the functions of the cracking catalysts of Frankenburg, it is important to appreciate how cracking catalysts operate and the requirement for the acidic nature for such a catalyst.

There are several mechanisms for catalytic cracking of hydrocarbons (e.g. alkanes and alkenes). The metal oxide can act as a Lewis acid, which would accept H^+ from the hydrocarbon. For instance, in the case of alumina, the aluminum would accept the electron pair of the hydrogen and form an intermediate carbonium ion of the hydrocarbon, which then fragments into smaller chain alkanes/alkenes:



The metal oxide can also act as a Bronsted acid, which would lose a H^+ to the hydrocarbon (i.e. alkene), and forms an intermediate carbonium ion that then fragments further:



In the above two examples the acidic nature of the catalyst, as established by the metal oxide (in this case alumina) is apparent. The alumina can either function as a Lewis acid or as a Bronsted acid in the cracking of long chain hydrocarbons into smaller chain hydrocarbons. In both of the above hydrocarbon cracking schemes the metal oxide either accepts hydrogen from a saturated hydrocarbon bond or gives up hydrogen to an unsaturated carbon bond which then leads to the cracking of the hydrocarbon into respective fragments. With this catalyzed reaction the aluminum oxide does not give up oxygen (because it is difficultly reducible), whereby the acidic nature of the catalyst, that is the presence of the hydrogen atom, is retained. The same catalytic reactions would occur with the use of titanium dioxide or zirconium oxide with this siliceous catalyst to ensure that the acidic nature of the catalyst is retained so that the catalyst may function properly as a cracking catalyst.

Not that it would be the case, but if oxygen were present during the catalytic cracking stage (which would be the case if oxygen donors were used), the hydrocarbons would combust to carbon dioxide and water before being cracked to their smaller chained molecules. This would clearly defeat the purpose of the cracking catalyst and that which is taught by Frankenburg. Since Frankenburg clearly teaches that there is a striking parallelism between the siliceous catalysts' effectiveness for the purposes of the invention and their effectiveness as petroleum cracking catalysts, the Frankenburg catalysts would not be effective as cracking catalysts if oxygen was present.

Frankenburg discloses that "difficulty reducible" metal oxides include alumina, titania, zirconia, chromium oxide and magnesium oxide which are used to maintain the active nature of the catalyst.

Two of the difficultly reducible metal oxides, namely titania and zirconia, are group IVB metal oxides, which are described in applicant's disclosure and recited in some of the claims. It should be noted however that as per Frankenburg, titania and zirconia are highly thermodynamically stable and will require temperatures well in excess of the maximum cigarette combustion temperatures, much higher than the free-burn temperature, in order to release oxygen from the metal oxide lattice. Applicant refers the Examiner to the enclosed references. **Hawley's Condensed Chemical Dictionary**, Eleventh Edition, Sax, N.I. and Lewis, R.J., page 1159 (1987) under the definition of titanium dioxide, teaches that titanium dioxide will reduce (eg. release oxygen) to titanium monoxide at 1500°C. Another reference, **Titanium It's Occurrence, Chemistry and Technology**, Second Edition, Barksdale, J. (1966), teaches at page 73 that titanium dioxide can be reduced using hydrogen as a reducing agent and heating to 1200-1500°C. Applicant notes that, in this case, a reducing agent was required along with heating the titanium dioxide in order to reduce the titanium dioxide. Also noted at page 73 titanium dioxide was found to be quite stable at its melting point of about 1800°C but reduced at

2230°C. Therefore, titania is "difficulty reducible" well in excess of the maximum cigarette combustion temperatures.

As an aside, this reference also discusses on page 68 that titanium dioxide at elevated temperatures can convert to different crystal phases (e.g., anatase, rutile and brookite crystalline phases). The various phases depend upon the temperature applied, for example, heating an anatase phase of titanium dioxide between 800 and 1000°C yields a rutile phase of titanium dioxide. However, it should be noted that these temperatures and the change of phase is only an alteration in crystalline structure and does not result in reduction of the titanium dioxide nor the release of any oxygen.

With respect to zirconia, **Science and Technology of Zirconia**, *Zirconia-an Overview*, Subbarao, E.C., pages 1 to 3 (1981) teaches that zirconia may exist in various crystal phases: cubic, tetragonal and monoclinic. By heating zirconia at >2370°C, cubic zirconia was formed. The cubic phase is stable from 2370°C; the tetragonal from 1170-2370°C, and the monoclinic is stable at all temperatures below 1170°C. It is noted at page 3 that zirconia interconverts between crystal phases at these various temperatures rather than reduce. As with titanium dioxide, zirconium oxide can change its crystalline structure at various temperatures. This change in crystalline structure does not result in release of oxygen. Therefore, such stability of the various crystal phases of zirconia makes zirconia "difficulty reducible" well in excess of the maximum cigarette combustion temperatures and for that matter well above the temperatures experienced during catalytic cracking.

SPECIFICATION REVISIONS

In view of the clear distinctions of applicant's invention over that described by Frankenburg, the claims and specification have been amended to include in all the independent claims a statement to the effect that the oxygen storage and donor metal oxide oxidation catalyst releases oxygen at the free burn rate temperatures of the burning cigarette. This feature cannot be achieved by the metal oxides employed in the cracking catalyst as described in his patent. The Examiner had suggested that the claims, as originally filed, encompassed some of the metal oxides used by Frankenburg and as specifically described by Frankenburg in column 2 at line 38; namely, zirconia and titania. These two metal oxides form part of the group of metal oxides claimed in original claim 10, for example, where the transition metal oxides are defined as being oxides from the group IVB metals. Applicant taught the use of transition metal oxides primarily for use in mixture with other forms of oxygen storage and oxygen donor metal oxide oxidation catalysts. Some of these transition metals are known to release oxygen at elevated temperatures; however, titanium oxide and zirconium oxide do not release their oxygen, as noted above, until well over a 1000°C which is way above the free burn rate temperature of a burning cigarette of this invention. The free burn rate temperature is normally in the range of about 400° to 550° C which is verified in Table 3A as part of Example 3 where the free burn temperature at the paper is 500°C plus or minus 20°C.

The dependent claims therefore have been revised to exclude group IVB metal oxides as being oxygen donors at the free burn temperatures of a burning cigarette of this invention. Instead the group IVB metal oxides have been retained in mixture with oxygen storage and oxygen donor metal oxides such as the rare earth metal oxides. Therefore, to the extent that the claims of this application inadvertently read on Frankenburg, they have now been revised to clearly distinguish therefrom. In order for applicant's invention to work, the oxygen storage oxygen donor metal oxide oxidation catalysts release oxygen at

the free burn rate temperatures of the burning cigarette. Otherwise, the oxygen would not be present to satisfy the manner in which this invention functions, such as described in the paragraph bridging pages 20 and 21 of applicant's specification. The release of the oxygen by the oxidation catalyst increases the free burn rate above the conventional free burn rate. As taught on page 21 beginning at line 7:

> "At this conventional free burn rate, the catalyst is capable of achieving a significant conversion of sidestream smoke components to noticeably reduce visible sidestream smoke..."

To further emphasize this point, and as taught in Example 3, the properties of the oxygen storage and donor metal oxide oxidation catalysts is further described in applicant's published PCT application WO99/53778. We have amended Example 3 to include the description from that earlier published PCT application to further emphasize the action of the oxygen storage and donor metal oxide oxidation catalysts and its ability to release oxygen at free burn rate temperatures of a burning cigarette. No new matter has been added to the specification on these pages so that favourable reconsideration of the amendment is requested. In keeping with this donation or release of oxygen at free burn temperatures, a typographical error in claim 65 has been corrected. Claim 65, as it appeared in the original filing, described the catalyst as directing oxygen to assist in maintaining conventional free burn rate. This obviously should have read said catalyst "donating" oxygen to assist in maintaining conventional free burn rate.

ANTICIPATION OF CERTAIN CLAIMS

Looking firstly at the rejection of the claims on the basis of anticipation, claim 43 is directed to a furnish composition for use in making a cigarette. The furnish composition comprises in combination, an oxygen storage and donor metal oxide oxidation catalyst and essentially non-combustible finely divided porous particulate adjunct where the oxygen storage and donor metal oxide

oxidation catalyst releases oxygen at the free burn rate temperatures of the burning cigarette.

Frankenburg teaches that the catalyst of his invention is a cracking catalyst which is a siliceous material in combination with minor amounts of metal oxide. Frankenburg does not teach nor is his catalyst material capable of donating oxygen at the free burn temperature in an oxygen containing environment while carrying out oxidation catalysis. Instead, as discussed above, the Frankenburg material contains silica with difficulty reducible metal oxides which are specifically designed to not release oxygen (see the Cracking Catalyst Section of this response). In order for a metal oxide to release oxygen it must be reduced, hence, the claim recitation that the oxidation catalyst be an oxygen storage and donor metal oxide is distinctly different from the catalysts of Frankenburg.

Furthermore, Frankenburg does not contemplate the use of a non-combustible finely divided porous particulate adjunct in combination with the siliceous catalyst. There is no teaching whatsoever of this adjunct to be used in combination with his catalyst. Nor would there be any need for an adjunct in a catalytic cracking environment.

It is therefore submitted that Frankenburg does not anticipate claim 43. Withdrawal of the rejection is requested.

Claims 48, 54 and 60 were also rejected as being anticipated by the Frankenburg reference. Again, claims 48, 54 and 60 recite a slurry composition or a treating composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and essentially non-combustible finely divided porous particulate adjunct for the catalyst where the oxygen storage and donor metal oxide oxidation catalyst releases oxygen at the free burn rate temperatures of the burning cigarette. For the same reasons advanced with respect to claim 43, Frankenburg does not anticipate claims 48, 54 or 60. Withdrawal of the rejection is requested.

OBVIOUSNESS OF REMAINING CLAIMS

Claims 1 to 17 et seq.

As noted above, these claims have been rejected as being obvious in view of Frankenburg. Claim 1 is directed to a low sidestream smoke cigarette comprising the treatment composition in the cigarette paper. It was asserted in the Office Action that it would have been obvious to modify the cigarette paper of Frankenburg with the recited treatment composition. As previously discussed, Frankenburg discloses a siliceous cracking catalyst having minor amounts of certain metal oxides. This is his treatment composition as found in the cigarette paper and, as the Examiner mentions, would be applied to the tobacco rod of the cigarette.

Firstly, Frankenburg does not disclose an oxidation catalyst. Instead he discloses a cracking catalyst, which as one skilled in the art would appreciate, is only used in an oxygen-free environment. So Frankenburg is using a cracking catalyst in an environment which is abnormal for a cracking catalyst. To that end, Frankenburg specifically teaches that the cracking catalyst has difficulty reducible metal oxides, that is, the metal oxides cannot be reduced to release oxygen. This is completely opposite to applicant's invention requiring the use of an oxidation catalyst which has the property of storing and donating oxygen during the oxidation catalytic process.

It was suggested in the Office Action that the metal oxides taught by Frankenburg for purposes of providing a proper acidic nature for his cracking catalyst could act as an oxygen donor. However as discussed above, Frankenburg clearly teaches that the metal oxides he uses are difficulty reducible. That is, they will not give up oxygen and thereby maintain the acidic nature of the catalyst. As previously defined, the metal oxides that Frankenburg teaches, and in particular the zirconium and titanium metal oxides, may release oxygen but at elevated temperatures well beyond and above the free burn rate temperature of a cigarette. Frankenburg could therefore not disclose or be modified to arrive at the invention as recited in the claims of this

application; namely, the oxygen storage and oxygen donor metal oxide oxidation catalyst releasing oxygen at the free burn rate temperatures of the cigarette. Therefore, it would not have been obvious to one of ordinary skill in the art to modify Frankenburg to arrive at the invention recited in the pending claims. Withdrawal of the rejection is requested.

As previously discussed to the extent that applicant's prior claims encompassed these metal oxides as potential oxygen storage and oxygen donor materials, the claims have been revised to exclude these metal oxides by deleting the metal of group IVB.

As applicant teaches in the specification the oxygen storage and donor metal oxide oxidation catalyst achieves a desired level of sidestream smoke reduction when used in combination with the non-combustible finely divided porous particulate adjunct. By use of the "in combination" applicant means, as taught on page 14, beginning at line 15, that if the catalyst and the adjunct are separate from one another that the ability to control sidestream smoke is greatly reduced. Instead, the catalyst and adjunct are used in combination which may be achieved by co-mingling the particular catalyst in admixture with the adjunct, contacting a layer of the adjunct with a catalyst layer or coating the catalyst on the adjunct or impregnating the catalyst within or on the porous surfaces of the adjunct to bring about the desired sidestream smoke control properties.

It was further suggested in the Office Action that particle sizes of the adjunct would be apparent from Frankenburg. As already discussed, this is not so nor would the high porosity be obvious nor would the surface area be obvious. Frankenburg's finely divided, finely powdered material is disclosed to be the catalyst not an adjunct. The incorporation of Frankenburg's catalyst in paper does not result in the treatment material of the cigarette paper recited in claim 1. Claims 2 through 17 depend from claim 11 as do claims 19 through 25 and 27 through 41. Claims 43 through 46 are directed to a furnish composition. Claim 43 was already discussed with respect to the anticipation

rejection. Claims 44 to 46 depend on claim 43. For the reasons discussed with respect to claim 1, the furnish composition of claim 43 would not be obvious nor would any of the dependent claims be obvious because Frankenburg would be destroyed and could not operate as intended if modified to include the combination of the oxygen storage and donor metal oxide oxidation catalyst with an essentially non-combustible finely divided porous particulate adjunct where the oxygen storage and donor metal oxide oxidation catalysts release oxygen at the free burn rate temperatures of the burning cigarette. Claims 48 to 51 are directed to the slurry composition which are also based on the same treatment composition. Claim 53 depends indirectly from claim 48. Claims 54 to 57 are directed to a cigarette paper which are also based on the same treatment composition. Claim 59 depends indirectly from claim 54. Claims 60 to 65 are based on the same treatment composition which are directed to a method for reducing sidestream smoke.

Claim 67 includes a low sidestream smoke cigarette comprising a sidestream smoke treatment composition which reduces visible sidestream smoke by greater than about 90%. There is no discussion in Frankenburg of the extent of reduction of sidestream smoke from the standpoint of visible smoke particles. Applicant is not aware of any prior art which provides a treatment composition in a combustible cigarette paper which reduces visible sidestream smoke by greater than 90% and, as such, claim 67 distinguishes from Frankenburg, as does dependent claims 68 through 72.

Claim 18

This claim was rejected based on Frankenburg in view of Schlatter et al. Claim 18 recites that the transition metal oxide may be iron oxide as the oxygen storage and donor metal oxide oxidation catalyst. Although Schlatter discloses iron oxide as a catalyst for promoting oxidation, Schlatter is concerned with an aerosol cigarette which has nothing to do with sidestream smoke reduction on a conventional cigarette. Aerosol cigarettes function totally differently from

normal conventional cigarettes having combustible cigarette wrappers. Schlatter is concerned with the use of iron oxides as an oxidation catalyst to promote oxidation of carbon monoxide to carbon dioxide. To suggest that an oxidation catalyst such as iron oxide can be used as a cracking catalyst in the invention of Frankenburg, completely ignores the teaching of Frankenburg. Frankenburg teaches that the siliceous catalysts are cracking catalysts and it is taught that other similar cracking catalysts may be useful in his invention. Cracking catalysts do not perform an oxidation reaction instead they are designed for use in an oxygen-free environment to crack hydrocarbons. To suggest substituting a cracking catalyst of Frankenburg with an oxidation catalyst would be inconsistent with the teachings of Frankenburg and not obvious to one of ordinary skill in the art. Withdrawal of the rejection is requested.

Claim 42

Claim 42 was rejected based on Frankenburg in combination with Kay et al. Claim 42 recites a treatment composition comprising cerium oxide as the oxygen storage and donor metal oxide oxidation catalyst in combination with the adjunct where said oxygen storage and donor metal oxide oxidation catalysts release oxygen at the free burn rate temperatures of the burning cigarette. It was suggested that it would have been obvious to substitute cerium oxide for the catalyst of Frankenburg because based on the Examiner's understanding of Kay et al., cerium oxide is taught as a cracking catalyst. This is incorrect.

Kay et al. is directed to a process for optimizing the removal of nitrogen oxides and sulfur oxides from flue gases (resulting from combustion of carbon and hydrocarbons). To optimize removal, nitrogen oxides are reacted with ammonia in the presence of a catalyst, such as ceria. During the process, when nitrogen oxides dissociate, oxygen is released and chemisorbed on active sites of the ceria catalyst, which renders the sites inactive. Hydrogen, released by the

dissociation of the ammonia, reacts with the oxygen on the catalyst sites clearing the sites so that the catalyst can promote dissociation of the nitrogen oxides. The best removal of nitrogen oxides is achieved with metal sulfates (e.g. cerium sulfate) rather than ceria. If ceria is used initially to remove the sulfur oxides, complete conversion of the ceria to cerium sulfate is limited and therefore, maximum removal of nitrogen oxides is limited. To maximize removal of nitrogen oxides, pure cerium sulfate is preferred in Kay et al.

Kay et al does not teach or suggest the use of ceria as an oxygen donor catalyst. In contrast, the ceria functions as a catalyst to aid in the reduction of nitrogen oxides.

Furthermore, in the background discussion, it is discussed that lanthanides, other than cerium, have been used as catalysts and that lanthanum oxide catalysts, in preference to cerium oxide catalysts, are used for cracking and hydrocracking. Therefore, Schlatter clearly teaches away from using ceria as a hydrocracking/cracking catalyst.

In view of the teaching of Kay et al., it clearly would not be obvious to use cerium oxide as a cracking catalyst. In fact, Kay teaches the exact opposite. Therefore the combination suggested in the Office Action would not render claim 42 obvious. Withdrawal of the rejection is requested.

Claims 47, 52, 58, 66 & 73

The Examiner has rejected claims 47, 52 and 58, 66 and 73 over Frankenburg in view of Kay et al. and Wendelbo. Frankenburg has been relied upon to teach that the siliceous catalyst may include natural or synthetic silicates with an acidic nature. Wendelbo is relied upon to disclose a zeolite having highly acidic properties and having major significance as a catalyst, particularly for catalytic cracking. Therefore, it was asserted that it would have been obvious to use zeolite as a catalyst adjunct in Frankenburg, however, Frankenburg describes the siliceous materials as being the catalyst not the adjunct. To then suggest that the zeolite could be the adjunct is opposite to

what is taught by Frankenburg who teaches that the zeolite would be the catalyst not the adjunct. Additionally, it would not have been obvious to modify Frankenburg as suggested because the resulting combination would not arrive at the recited invention including the recited oxygen storage and oxygen donor metal oxide.

Claims 74 to 78

These claims are rejected over Frankenburg in view of Wendelbo. Frankenburg describes his siliceous catalyst as including natural or synthetic silicates. It was asserted that it would have been obvious to use the zeolites of Wendelbo as a catalyst adjunct in Frankenburg. Again, this is not correct. In Frankenburg, the catalyst is a siliceous material. To substitute zeolite for a siliceous material would provide the zeolite as the catalyst with or without the minor amounts of the taught metal oxides if the acidic nature of the zeolite is not appropriate for catalytic cracking. This would not lead to the combination of applicant's claimed treatment composition, because the metal oxide of Frankenburg is taught as being a difficulty reducible metal oxide; that is, it would not donate oxygen at the operating temperatures of the catalyst. If it did donate oxygen, the catalyst would loose its acidic nature and no longer function properly, as taught by Frankenburg. Therefore, the asserted modification would not have been obvious to the ordinary artisan. Withdrawal of the rejection is requested.

Claims 79, 82 to 89

Claims 79, 82 to 89 were rejected over Frankenburg in view of Tatsushima. Tatsushima describes an ozone cracking catalyst which comprises manganese oxide on a ceramic fiber aggregate. Frankenburg teaches a tri-component cracking catalyst consisting of silica, alumina and zirconia. It was suggested that the zirconia of Frankenburg may be substituted with the zirconia

fiber of Tatsushima. However, that combination does not provide for an oxygen storage and donor metal oxide oxidation catalyst.

Firstly, there is no teaching in Tatsushima that its' ozone cracking catalyst may be used in tobacco products. Secondly, the catalysts in Frankenburg are known as hydrocarbon cracking catalysts (see Column 2, line 10) not ozone cracking catalysts. Therefore, there would be no motivation to combine these references since Frankenburg is directed to a different type of catalyst. Furthermore, the tri-component cracking catalyst consisting of silica, alumina and zirconia fiber, based on the combination of Frankenburg and Tatsushima as suggested in the Office Action, would not function as an oxygen donor metal oxide oxidation catalyst which releases oxygen at the free burn rate temperatures of the burning cigarette. Therefore, for these reasons, claims 79, 82 to 89 are patentable over Frankenburg in view of Tatsushima. Withdrawal of the rejection is requested.

Claim 26

Applicant notes that Claim 26 would be allowed if rewritten in independent form. Accordingly, that has been done.

Applicant has made concerted efforts to point out the distinctions of the claims in view of this prior art and favorable reconsideration in this respect is requested.

CONCLUSION

If any fees are required or if an overpayment is made, the Commissioner is authorized to debit or credit our Deposit Account No. 19-0733, accordingly.

All rejections having been addressed, applicants respectfully request that the instant application is in condition for allowance, and respectfully solicit prompt notification of the same.

Respectfully submitted,

Dated: July 28, 2003

By: Brian E. Hanlon
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Marked-Up Version of Specification and Claims for U.S. Serial No. 09/954,432

IN THE SPECIFCATION

Please amend the specification as set forth below:

Please replace the Paragraph on page 5, lines 22-29 with the following:

The invention provides for a significant reduction in sidestream smoke in its various applications. It has been found that such reduction in sidestream smoke can surprisingly be achieved by the combined use in a sidestream smoke treatment composition, of an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for the catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette. This composition may be used with normal combustible cigarette paper to provide acceptable free-burn rates while minimizing or virtually eliminating visible sidestream smoke.

Please replace the Paragraph on page 7, lines 17-22, with the following:

According to other aspects of the invention, a low sidestream smoke cigarette comprises a conventional tobacco rod and a combustible treatment paper having a sidestream smoke treatment composition for said rod, said treatment composition comprises in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for said catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette.

Please replace the Paragraph beginning on page 7, lines 23-30 and continuing onto page 8, lines 1-2 with the following:

According to an aspect of the invention, a low sidestream smoke cigarette comprising a conventional tobacco rod, and a combustible treatment

paper having a sidestream smoke treatment composition comprising cerium oxide which functions both as an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for the catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette. According to another aspect of the invention, a furnish composition for use in making a cigarette treatment paper for reducing sidestream smoke emitted from a burning cigarette comprises in combination an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette.

Please replace the paragraph on page 8, lines 3-8, with the following:

According to a further aspect of the invention, a low sidestream smoke cigarette comprising a conventional tobacco rod, and a combustible treatment paper having a sidestream smoke treatment composition, said treatment composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible zeolite adjunct for said catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette.

Please replace the paragraph on page 8, lines 9-13, with the following:

According to a further aspect of the invention, a slurry composition for application to cigarette paper for reducing sidestream smoke emitted from a burning cigarette comprises in combination with an oxygen storage and donor metal oxide oxidation catalyst, an essentially non-combustible finely divided porous particulate adjunct for said catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette.

Please replace the paragraph on page 8, lines 14-19, with the following:

According to another aspect of the invention, a combustible cigarette paper for use on a smokable tobacco rod of a cigarette for reducing sidestream smoke emitted from a burning cigarette, the cigarette treatment paper including a sidestream smoke treatment composition comprising in combination an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette.

Please replace the paragraph on page 8, lines 20-25, with the following:

According to another aspect of the invention, a method for reducing sidestream smoke emitted from a burning cigarette, comprises treating sidestream smoke with a treatment composition carried by a combustible cigarette paper, said treatment composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for said catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of the cigarette.

Please replace the Paragraph beginning on page 13, lines 23-31 and continuing onto page 14, lines 1-8, with the following:

The oxygen donor and oxygen storage metal oxide oxidation catalyst is most preferably selected from the transition metal oxides, rare earth metal oxides, (such as scandium, yttrium, and lanthanide metal series, i.e. lanthanum) and mixtures thereof. It is appreciated that the catalyst may be in its metal oxide form or a precursor of the metal oxide which, at the temperature of the burning cigarette, is converted to a metal oxide to perform its catalytic activities. The selected oxygen donor and oxygen storage metal oxide oxidation catalyst in its catalytic form releases oxygen at free burn rate temperatures of the burning cigarette. The transition metal oxides may be selected from oxides of the group of metals from the Periodic Table consisting of

groups IVB, VB, VIB, VIIB, VIII and IB metals and mixtures thereof. Preferred metals from the transition metal group are oxides of iron, copper, silver, manganese, titanium, zirconium, vanadium and tungsten and from the rare earth group are oxides of lanthanide metals such as oxides of cerium. For example, cerium may be used in admixture with any one of the transition metals. It is appreciated that other metal oxide oxidation catalysts may be used with the oxygen storage and oxygen donor type of catalyst. Such other metal catalysts include precious metals and metals from groups IIA, IVA and mixtures thereof. Examples include tin, platinum, palladium and mixtures thereof.

Please replace the Paragraph on page 24, lines 7-24, with the following:

The treatment paper is combustible, burns in a conventional manner, and ashes. The burning characteristics were measured quantitatively following the ISO Procedure, ISO 4387, see Second Ed., October 15, 1991 (for determination of total and nicotine-free dry particulate matter using a routine analytical smoking machine). Prototype 359-3, as shown in Table 3A, has an average puff count of 8.7 puffs per prototype compared to an average 9.5 puffs per conventional cigarette. The calculated burn rates show in Table 3A that Prototype 359-3 has substantially the same burn rate of 0.09 mm/sec as the conventional cigarette. Burn temperature profile measurements were taken in accordance with a technique described in published PCT application WO 99/53778, the subject matter of which is hereby incorporated by reference. The oxygen storage and donor metal oxide oxidation catalyst described in this published PCT application is typical of the oxygen storage and donor metal oxide oxidation catalyst described in this application. As taught in this published PCT application, the selected oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of a burning cigarette. Preferred oxygen storage and donor metal oxide oxidation catalyst are capable of releasing oxygen at elevated temperatures normally in the range of 400° C to 550° C. The results of Table 3A are consistent with the above measurements, showing the Prototype burn characteristics both during the puff

and the burn are substantially the same as the conventional cigarette. During puff, the control had a slightly lower temperature as measured at the paper surface, at the centreline of the cigarette and at a position ½ way along the radius of the cigarette. During burning, the paper temperature of the control and the Prototype 359-3 had essentially the same temperature.

IN THE CLAIMS:

Amend claim 1 follows:

1. (Amended). A low sidestream smoke cigarette comprising a conventional tobacco rod, and a combustible treatment paper having a sidestream smoke treatment composition, said treatment composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for said catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures for said cigarette.

Amend claim 9 as follows:

9. (Amended). A cigarette of claim 1, wherein said catalyst is selected from the group consisting of a transition metal oxide[s,] selected from the group consisting of group VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof; a rare earth metal oxide[s] and mixtures thereof; and a mixture of said transition metal oxide and said rare earth metal oxide.

Amend claim 10 as follows:

10. (Amended). A cigarette of claim [9] 1, wherein said catalyst is a mixture of a rare earth metal oxide and a transition metal oxide[s], said transition metal oxide being [are] selected from the group consisting of group IVB, VB, VIB, VIIB, VIII, IB metal[s] oxides and mixtures thereof.

Amend claim 17 as follows:

17. (Amended). A cigarette of claim 16 wherein said selected metal or metal oxide oxidation catalyst is selected from the group consisting of platinum, palladium, copper oxide, iron oxide, magnesium oxide, silver oxide, titanium oxide, zirconium oxide and mixtures thereof.

Amend claim 26 as follows:

26. (Amended). [A cigarette of claim 1,] A low sidestream smoke cigarette comprising a conventional tobacco rod, and a combustible treatment paper having a sidestream smoke treatment composition, said treatment composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for said catalyst where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures for said cigarette and wherein a first amount of cerium oxide in said treatment composition is said particulate adjunct and a second amount of said cerium oxide in said treatment composition is said oxygen donor catalyst.

Amend claim 42 as follows:

42. (Amended). A low sidestream smoke cigarette comprising a conventional tobacco rod, and a combustible treatment paper having a sidestream smoke treatment composition comprising cerium oxide which functions both as an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for said catalyst, where said cerium oxide releases oxygen at free burn rate temperatures of said cigarette.

Amend claim 43 as follows:

43. (Amended). A furnish composition for use in making a cigarette treatment paper for reducing sidestream smoke emitted from a burning cigarette, said furnish composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct where said oxygen storage and donor metal oxide oxidation catalysts releases oxygen at free burn rate temperatures of a cigarette made from paper derived from said furnish composition.

Amend claim 45 as follows:

45. (Amended). A furnish composition of claim 44, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is selected from the group consisting of a transition metal oxide[s], selected from the group consisting of group VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof; a rare earth metal oxide[s] and mixtures thereof; and a mixture of said transition metal oxide and said rare earth metal oxide.

Amend claim 46 as follows:

46. (Amended). A furnish composition of claim [45] 44, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is a mixture of a rare earth metal oxide and a transition metal oxide[s] said transition metal oxide being [are] selected from the group consisting of group IVB, VB, VIB,VIIB, VIII, IB metal[s] oxides and mixtures thereof, and said rare earth metal oxides [are] being selected from the group consisting of

scandium, yttrium, lanthanum, and lanthanide metal[s] oxides and mixtures thereof.

Amend claim 48 as follows:

48. (Amended). A slurry composition for application to cigarette paper for reducing sidestream smoke emitted from a burning cigarette, said slurry composition comprising in combination an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of a cigarette made from paper derived from said slurry composition.

Amend claim 50 as follows:

50. (Amended). A slurry composition of claim 49, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is selected from the group consisting of a transition metal oxide[s], selected from the group consisting of group VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof; and a rare earth metal oxide[s] and mixtures thereof and a mixture of said transition metal oxide and said rare earth metal oxide.

Amend claim 51 as follows:

51. (Amended). A slurry composition of claim [50] 49, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is a mixture of a rare earth metal oxide and a transition metal oxide[s], said transition metal oxide being [are] selected from the group consisting of group IVB, VB, VIB,VIIB, VIII, IB metal[s] oxides and mixtures thereof, and said

rare earth metal oxide[s] [are] being selected from the group consisting of scandium, yttrium, lanthanum, and lanthanide metal oxides and mixtures thereof.

Amend claim 54 as follows:

54. (Amended). A combustible cigarette paper for use on a smokable tobacco rod of a cigarette for reducing sidestream smoke emitted from a burning cigarette, said cigarette treatment paper including a sidestream smoke treatment composition comprising in combination an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct where said oxygen storage and donor metal oxide oxidation catalyst releases oxygen at free burn rate temperatures of a cigarette made from said cigarette paper.

Amend claim 56 as follows:

56. (Amended). A cigarette paper of claim 55, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is selected from the group consisting of a transition metal oxide[s,] selected from the group consisting of group VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof; a rare earth metal oxide[s] and mixtures thereof; and a mixture of said transition metal oxide and said rare earth metal oxide.

Amend claim 57 as follows:

57. (Amended). A cigarette paper of claim [56] 55, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is a mixture of a rare earth metal oxide and a transition metal oxide[s], said transition metal

oxide being [are] selected from the group consisting of group IVB, VB, VIB,VIIB, VIII, IB metal[s] oxides and mixtures thereof, and said rare earth metal oxide[s] [are] being selected from the group consisting of oxides of scandium, yttrium, lanthanum, and lanthanide metal[s] oxides and mixtures thereof.

Amend claim 60 as follows:

60. (Amended). A method for reducing sidestream smoke emitted from a burning cigarette, comprising treating sidestream smoke with a treatment composition carried by a combustible cigarette paper, said treatment composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible finely divided porous particulate adjunct for said catalyst, said oxygen storage and donor metal oxide oxidation catalyst releasing oxygen at free burn rate temperatures of said burning cigarette.

Amend claim 62 as follows:

62. (Amended). A method of claim 61, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled carbon or ceramic fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is selected from the group consisting of a transition metal oxide[s] selected from the group consisting of group VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof; a rare earth metal oxide[s] and mixtures thereof; and a mixture of said transition metal oxide and said rare earth metal oxide.

Amend claim 63 as follows:

63. (Amended). A method of claim [61] 62, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled carbon or ceramic fibres, monolithic mineral based materials, essentially non-

combustible activated carbon, zeolites and mixtures thereof, and said catalyst is a mixture of a rare earth metal oxide and a transition metal oxide[s], said transition metal oxide being [are] selected from the group consisting of [oxides of] group IVB, VB, VIB,VIIB, VIII, IB metal[s] oxides and mixtures thereof, and said rare earth metal oxide[s] [are] being selected from the group consisting of scandium, yttrium, lanthanum, and lanthanide metal[s] oxides and mixtures thereof.

Amend claim 65 as follows:

65. (Amended). A method of claim 62, wherein said adjunct has a surface area greater than about 20 m^2/g, said sidestream smoke being selectively adsorbed by said adjunct and oxidized by said catalyst to produce non-visible sidestream smoke emanating from said burning cigarette, said catalyst donating [directing] oxygen to assist in maintaining conventional free-burn rates and burn temperature.

Amend claim 71 as follows:

71. (Amended). A cigarette of claim 70, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled carbon or ceramic fibres, monolithic mineral based materials, essentially non-combustible activated carbon, zeolites and mixtures thereof, and said catalyst is selected from the group consisting of a transition metal oxide[s], selected from the group consisting of group VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof; a rare earth metal oxide[s] and mixtures thereof; and a mixture of said transition metal oxide and said rare earth metal oxide.

Amend claim 72 as follows:

72. (Amended). A cigarette of claim [71] 70, wherein said adjunct is selected from the group consisting of clays, essentially non-combustible milled carbon or ceramic fibres, monolithic mineral based materials, essentially non-

combustible activated carbon, zeolites and mixtures thereof, and said catalyst is a mixture of a rare earth metal oxide and a transition metal oxide[s], said transition metal oxide being [are] selected from the group consisting [of oxides] of group IVB, VB, VIB,VIIB, VIII, IB metal[s] oxides and mixtures thereof, and said rare earth metal oxide [are] being selected from the group consisting of oxides of scandium, yttrium, lanthanum, and lanthanide metal[s] oxides and mixtures thereof.

Amend claim 74 as follows:

74. (Amended). A low sidestream smoke cigarette comprising a conventional tobacco rod, and a combustible treatment paper having a sidestream smoke treatment composition, said treatment composition comprising in combination, an oxygen storage and donor metal oxide oxidation catalyst and an essentially non-combustible zeolite adjunct for said catalyst, said oxygen storage and donor metal oxide oxidation catalyst releasing oxygen at free burn rate temperatures of said cigarette.

Amend claim 75 as follows:

75. (Amended). A cigarette of claim 74, wherein said catalyst is selected from the group consisting of a transition metal oxide[s], selected from the group consisting of group VB, VIB, VIIB, VIII, IB metal oxides and mixtures thereof; a rare earth metal oxide[s] and mixtures thereof; and a mixture of said transition metal oxide and said rare earth metal oxide.

Amend claim 76 as follows:

76 (Amended). A cigarette of claim 75, wherein said catalyst is a mixture of a rare earth metal oxide and a transition metal oxide[s], said transition metal oxide being [are] selected from the group consisting of [oxides of] group IVB, VB, VIB,VIIB, VIII, IB metal oxides and mixtures thereof.

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Image

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE THE APPLICATION OF	)
	) Atty Dkt No.: 000417.0002
Stanislav M. SNAIDR et al.	)
	)
SERIAL NO.: 09/954,432	) GROUP ART UNIT: 1731
	)
FILED: September 18, 2001	)
	) Examiner: WALLS, Dionne A.
FOR: Low Sidestream Smoke Cigarette With Combustible Paper	)

DECLARATION PURSUANT TO M.P.E.P. § 608.01(p)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1350

Dear Sir:

Pursuant to M.P.E.P. §608.01(p), the undersigned hereby declares that the amendatory language added to the paragraph on Page 24, lines 7-24 (Amendment filed July 28, 2003), consists of the same material originally incorporated by reference in the subject application. Explicit and implicit support for this amendment that incorporates the amendatory language from the referenced International Patent Application is found in the originally filed specification of the subject application.

Recitations in the originally filed specification evidencing Applicants' intent to incorporate the amendatory language can be found, for example, on Page 12, lines 19-23. These lines on Page 12 disclose that the catalyst used in the present invention converts "captured components" into oxidized compounds at the high temperature of the burning cigarette. One skilled in the art would readily understand that this language was addressing the fact that oxygen is released/donated from the catalyst to cause oxidation as

discussed in the amendatory language incorporated from the referenced International Patent Application. The intent to originally incorporate the amendatory language is also supported by the language of original claim 65, which recited that the catalyst directs oxygen to assist in maintaining conventional free-burn rates and burn temperature. Additional support for the amendatory language and the clear intent of the Applicants to incorporate the amendatory language is found on Page 13, line 26-29 and Page 20, line 29 to Page 21, line 11.

I further declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful and false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

Dated: December 3, 2003

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